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STUDIES IN THE TIPHIIDAE. VII.[1] THE MADAGASCAN SPECIES

(HYMENOPTERA ACULEATA)

By KARL V. KROMBEIN, *Bureau of Entomology and Plant Quarantine, United States Department of Agriculture*

Over 100 years have elapsed since Guérin described briefly the first tiphiid wasp from Madagascar, a male which he called *Myzine nodosa*. Relatively few species have been described since that time due to the paucity of material in collections. Smith presented the brief description of a new anthoboscine in 1879, the second known tiphiid from the island. The most significant contribution was made by Saussure in 1892 in his magnificent treatment of the Madagascan Hymenoptera. In this work Saussure redescribed fully and figured the Guérin and Smith species mentioned above and a *Tiphia* and *Methocha* which he had described as new just the year previous. Turner described two *Mesa* in 1908 and 1910, one of which is placed in synonymy herein.

Recently I have had an opportunity to study nearly 200 specimens from Madagascar belonging to this subfamily. Most of this material was collected by the late André Seyrig and was made available through the kindness of V. S. L. Pate and J. C. Bradley of Cornell University. Ch. Lamberton of Tananarive, Madagascar has supplied some interesting novelties. Several specimens have been available from the collection of the U. S. National Museum.

Determined material of some African species has been available from my personal collection from exchanges with the late R. E. Turner of the British Museum (Natural History) and C. Jacot-Guillarmod of Basutoland, South Africa. Comparison of Madagascan species with those available from the African mainland indicates that the former are specifically distinct from those found on the mainland. This opinion may require some revision when additional material from the mainland is available.

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[1]Preceding sections appearing under this general title are as follows: I. 1937. Ann. Ent. Soc. Amer. 30:26-30.—II. 1938. Trans. Amer. Ent. Soc. 64:227-292, 12 figs.—III. 1938. Ann. Ent. Soc. Amer. 31:59-60.—IV. 1940. Trans. Amer. Ent. Soc. 65:415-465, pl. 24.—V. 1942. Rev. de Ent. 13:308-353, 7 figs.—VI. (Joint paper with C. E. Mickel). 1942. Amer. Midl. Nat. 28:648-679, 3 pls.

The results of this study may be summarized briefly as follows: *Myzine nodosa* Guérin and *Plesia* (*Mesa*) *saussurei* Turner are transferred to *Mesa* Saussure; *Plesia* (*Mesa*) *hova* Turner is sunk as a synonym of *nodosa;* the previously unrecognized male of *saussurei* is described; four new species of *Mesa* are described, *seyrigi*, *marovatana*, *tandrona* and *madecassa*, from both sexes; a new *Meria*, *vonizongo*, is also described, based on a male—this genus has never been reported from Madagascar previously, though it is widespread in other parts of the Ethiopian, and in the Palaearctic and Oriental regions; two new *Methocha* are described, *arnoldi* and *lambertoni*, both known from males only; one new *Tiphia* is described, *saussurei*, from both sexes; and one new *Anthobosca* is described, *madecassa*, from both sexes. Descriptions paraphrased from previous ones are offered in the case of the two species which have not been available for study. A key is presented for the identification of both sexes, and also illustrations of the male genitalia of Myzininae which are difficult to separate on external characters alone.

This study cannot be regarded as complete. While Seyrig collected extensively in many parts of the island, he did not collect along the dry southwest coast and I have had no material from that critical region. This strip of semi-desert has an interesting and peculiar xerophilous flora, and it is quite possible that if Tiphiidae are present at all, they would be different from the species occurring elsewhere on the island.

Key to the Madagascan Tiphiidae[2]

1. Females (those of *Methocha lambertoni*, *M. arnoldi and Meria vonizongo* are unknown) 2
   Males (those of *Methocha cambonini*, *Tiphia bisinuata* and *Anthobosca insularis* are unknown) 12
2. Wingless, slender, antlike form; hind tibia with only one apical spur. Subfamily METHOCHINAE ..... *Methocha cambonini*[3] Saussure, p. 71
   Winged, robust forms, not antlike in appearance; hind tibia with two apical spurs 3
3. Antennae not arising from beneath a frontal prominence, 12-segmented, the pedicel not hidden in the apex of the scape 4
   Antennae arising from beneath a frontal prominence, apparently only 11-segmented, the pedicel hidden in the apex of the scape. Subfamily MYZININAE 7

[2] I have not seen material of *Methocha cambonini* Saussure or *Tiphia bisinuata* Saussure and these two species have been included in the key on the basis of previous descriptions.

[3] Male unknown.

4. Forewing with only two submarginal cells; anal lobe of hind wing longer than submedian cell; dorsal surface of propodeum with a central trapezoidal areola enclosed by strong carinae. Subfamily TIPHIINAE 5

   Forewing with three submarginal cells; anal lobe of hind wing shorter than submedian cell; dorsal surface of propodeum without enclosed area. Subfamily ANTHOBOSCINAE 6

5. Disk of first abdominal tergite with a transverse carina anteriorly ..... *Tiphia bisinuata*[3] Saussure, p.56

   Disk of first tergite without such a carina ..... *Tiphia saussurei*, new species, p. 54

6. Large forms, 23-31 mm. in length; head ferruginous, thorax in greater part black, abdomen with lunate ferruginous spot on first tergite, but without anterolateral creamy spots on tergites two and three; wings strongly yellowish, marginal cell acute at apex, basal vein of forewing proximad of transverse median; anterior tibial spur with a small tooth along inner edge about two-thirds the distance from base; pygidium covered with short, stout bristles ..... *Anthobosca insularis*[3] (Smith), p. 50

   Small forms, 5.5-7 mm. in length; head and thorax except venter, ferruginous, abdomen without lunate ferruginous mark on first tergite, but with anterolateral creamy spots on second and third tergites; wings hyaline, marginal cell rounded at apex, basal and transverse median veins of forewing interstitial; anterior tibial spur deeply cleft at apex; pygidium with bristles on basal fourth only, the remainder shagreened ..... *Anthobosca madecassa*, new species, p. 52

7. Longer spur of hind tibia with outer margin right-angled beyond basal emargination; upper median half of front broadly impunctate beneath ocelli; head and usually dorsum of pro- and mesothorax ferruginous, abdomen always black ..... *Mesa nodosa* (Guérin), p. 62

   Longer spur of hind tibia broadly rounded on outer margin just beyond basal emargination; upper median half of front usually moderately to densely punctate, or if broadly impunctate, then the thorax and abdomen more extensively ferruginous 8

8. Wings mostly subhyaline, infumated only in the marginal cell; ocelli arranged in an equilateral triangle; comb of hairs on ventral surface of hind basitarsus margined outwardly by a row of about six flat, short spines on basal two-thirds and a long slender bristle about three-quarters the distance from base ..... *Mesa seyrigi*, new species, p. 64

   Wings strongly infumated; ocelli arranged in an obtuse triangle; comb of hairs on ventral surface of hind basitarsus margined outwardly by two long slender bristles placed about half and three-quarters the distance from base 9

9. Very coarsely punctate, dorsum of pronotum rugosely so; entirely black except for the ferruginous mandibles, clypeus, antennae and legs in part; narrow apical rim of pygidium rather coarsely shagreened ..... *Mesa saussurei* (Turner), p. 59
Less coarsely punctate, or with a different combination of characters 10

10. Ocellocular distance slightly more than twice the postocellar distance; upper half of median part of front broadly impunctate; first two abdominal tergites and propodeum extensively ferruginous ..... *Mesa madecassa*, new species, p. 66
Ocellocular distance less than twice the postocellar distance; upper half of median part of front not broadly impunctate; abdomen either entirely black or with middle of second and last three tergites entirely ferruginous 11

11. Occipital carina margined beneath anteriorly by a crenulate groove; mid and hind tibial spurs white; scutellum with denser punctures arranged more or less in longitudinal rows; pygidium with apex reflexed upward; abdomen black; vestiture white and ferruginous. *Mesa tandrona*, new species, p. 69
Groove adjacent to occipital carina not crenulate beneath; mid and hind tibial spurs ferruginous; scutellum with sparser punctures which are not arranged in longitudinal rows; pygigium flat in profile, apex not reflexed upward; abdomen with second to sixth segments in part, or entirely, ferruginous or castaneous; vestiture dark. *Mesa marovatana*, new species, p. 68

12. Hypopygium in profile flat, broadly rounded and not much narrowed at apex; no constriction between first and second abdominal sternites. Subfamily ANTHOBOSCINAE ..... *Anthobosca madecassa*, new species, p. 52
Hypopygium in profile with apex strongly recurved, very slender; a deep constriction between first and second abdominal sternites 13

13. Forewing with only two submarginal cells; antennae 13-segmented, the pedicel not hidden in the apex of the scape 14
Forewing with three submarginal cells; antennae apparently only 12-segmented, the pedicel hidden in the apex of the scape. Subfamily MYZININAE 16

14. Hind wing with anal lobe longer than submedian cell; tegula covering axillary sclerites of forewing; dorsal surface of propodeum with a central, trapezoidal area bounded by strong carinae. Subfamily TIPHIINAE ..... *Tiphia saussurei*, new species, p. 54
Hind wing with anal lobe shorter than submedian cell; tegula not covering axillary sclerites of forewing; dorsal surface of propodeum without such an enclosed space. Subfamily METHOCHINAE 15

15. Relatively finely and sparsely punctured, the punctures on dorsum of pronotum and mesopleuron separated by several times the width of a puncture; lateral surface of propodeum with fine, oblique rugulae; a broad, deep punctiform impression anteriorly between mesopleuron and mesosternum. ..... *Methocha lambertoni*,[4] new species, p. 73

Relatively coarsely and densely punctured, the punctures on dorsum of pronotum and mesopleuron separated by less than the width of a puncture; lateral surface of propodeum with coarse, contiguous punctures arranged in oblique rows; no such impression between mesopleuron and mesosternum. ..... *Methocha arnoldi*,[4] new species, p. 72

16. First tergite not elongate, not nodose apically, broadly sessile with second segment; thorax maculated with yellow, last abdominal segment ferruginous; hind basitarsus shorter than second and third segments together (Text Fig. 1). ..... *Meria vonizongo*,[4] new species, p. 57

First tergite elongate, nodose apically and not broadly sessile with second segment; thorax and last abdominal segment black; hind basitarsus longer than second and third segments together 17

17. First sternite on basal half with two longitudinal carinae flanking a narrow punctate groove; posterior slope of propodeum rugosoreticulate; apex of clypeus and some of abdominal tergites laterally or apically, usually creamy; paramere extremely broad, compressed, inner surface of cuspis with scales (Plate 6, Fig. 1). ..... *Mesa saussurei* (Turner), p. 59

First sternite evenly convex, not carinate as above; clypeus and abdomen entirely black; paramere not so broad 18

18. Tegula and all tibiae with some creamy markings; size smaller, not over 13 mm. in length; abdomen more densely silvery haired; posterior slope of propodeum closely punctate, not at all rugose; genitalia as figured, inner surface of cuspis with scales (Plate 6, Fig. 2). ..... *Mesa nodosa* (Guérin), p. 62

Tegula and tibiae without creamy markings; size larger, 15 mm. or more in length; posterior slope of propodeum rugosopunctate, though not so coarsely as in *saussurei;* abdomen rather sparsely pubescent; inner surface of cuspis without scales except in *seyrigi.* 19

19. Genitalia as figured (Plate 6, Fig. 6), paramere broadest at apex, truncate apically, inner surface of cuspis with a few scales ..... *Mesa seyrigi*, new species, p. 64

Genitalia as figured (Plate 6, Figs. 3-5), paramere narrowing toward apex, inner surface of cuspis without modified setae ... 20

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[4]Female unknown.

20. Pygidial area delimited laterally by carinae extending two-thirds of distance from apex to base of exposed part of tergite; upper triangular area of metapleuron rugulose; genitalia as figured, paramere at tip hooked, the inner surface with sparser, shorter, stouter hairs, cuspis on inner surface more sparsely haired (Plate 6, Fig. 5) ..... *Mesa tandrona*, new species, p. 69

Pygidial area delimited laterally by carinae extending not more than one-third the distance from apex to base of exposed part of tergite; upper triangular area of metapleuron smooth; genitalia with paramere not hooked at tip, the inner surface with denser, longer, finer hairs, cuspis on inner surface more densely haired 21

21. Apical emargination of pygidium shallower and broader, twice as wide as deep, the delimiting carinae shorter and weaker; anterior tibia with creamy spots at base and apex, otherwise ferruginous; genitalia as figured, paramere narrower, gradually narrowed toward tip (Plate 6, Fig. 4). ..... *Mesa marovatana*, new species, p. 68

Apical emargination of pygidium deeper and narrower, almost as deep as wide, the delimiting carinae longer and stronger; anterior tibia entirely ferruginous; genitalia as figured, paramere broader, more abruptly narrowed toward tip (Plate 6, Fig. 3) ..... *Mesa madecassa*, new species, p. 66

Anthobosca insularis (Smith)

Myzine insularis Smith, 1879. Descr. n. spp. Hym. Brit. Mus., p. 178. [♀; Madagascar; type in British Museum (Natural History).]

Cosila insularis (Smith) Saussure, 1892. *In* Grandidier, Hist. Madag. 20:231, pl. 5, fig. 13. [♀; Madagascar; redescription of type.]—Dalla Torre, 1897. Cat. Hym. 8:142.

Anthobosca insularis (Smith) Turner, 1912. Proc. Zool. Soc. London, p. 728 (in key), p. 737, pl. 82, fig. 6, pl. 83 fig. 8. [♀; Madagascar; redescription of type and additional specimens.]

I have seen only one female of this species, a specimen from Tananarive (Ch. Lamberton) in the Cornell University collection. The female is readily distinguished from *madecassa*, the only other Madagascan *Anthobosca*, by its larger size (23-31 mm.), yellowish wings, acute marginal cell, and lack of anterolateral creamy maculations on the second and third tergites. The male is unknown.

Turner states that the size varies from 23-29 mm. His illustration shows the transverse median vein of forewing proximad of the basal vein, whereas the reverse is true in the specimen before me.

Female. Length 31 mm. Black, shining; head except beneath, palpi, mandible except apex, antenna, mesoscutum, middle of scutellum, all

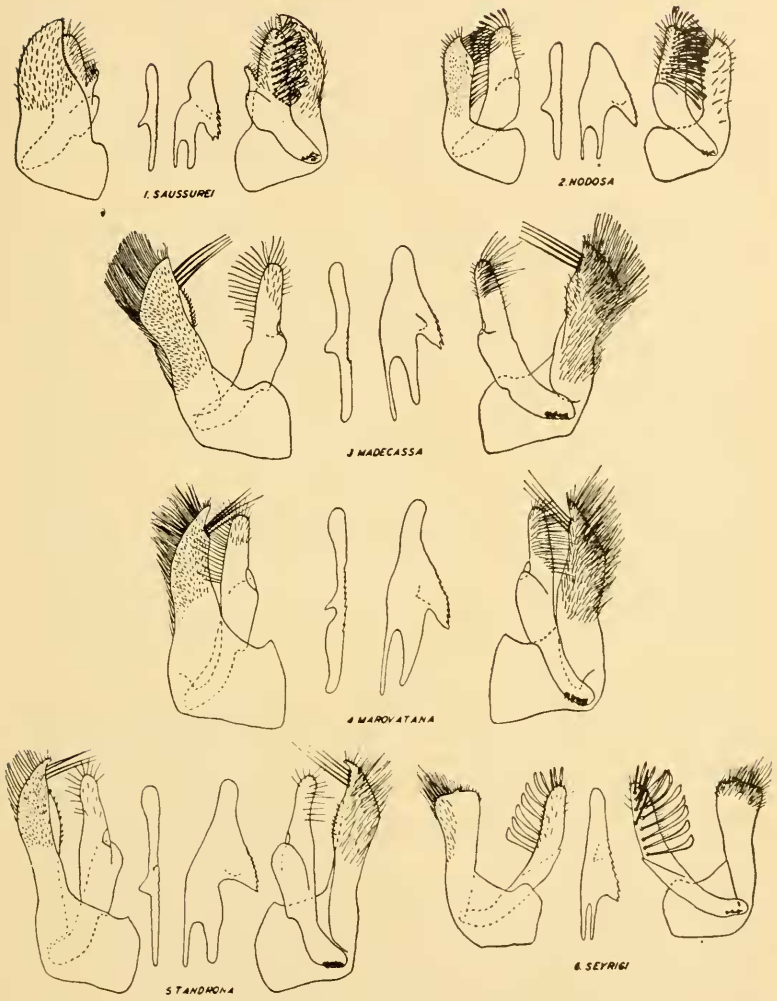


Plate 6. Male Genitalia of Madagascan Mesa

Each set of figures is arranged to show external lateral aspect at left (cardo and aedeagus omitted), followed by ventral and lateral views of aedeagus, and internal lateral aspect (22X).

tibial calcaria, tarsi, and transverse lunate spot on disk of first tergite, ferruginous; tibiae and abdominal tergites laterally suffused with castaneous. Vestiture rather short, sparse, black except on pygidium where it is ferruginous. Wings and nervures strongly yellowish, stigma ferruginous.

Head: Produced median part of clypeus slightly emarginate, the clypeus coarsely and densely punctate; lower two-thirds of front very densely punctate, the upper third more sparsely so; ocelli in a low triangle, the ocellocular distance twice the postocellar distance; vertex sparsely punctate.

Thorax: Pronotum with large, moderately dense punctures dorsally and laterally; mesoscutum and scutellum with finer, sparser punctures; postscutellum with dense, fine punctures and a few scattered, large ones; disk of mesopleuron with scattered large punctures and dense, minute ones; propodeum dorsally with dense small punctures in middle, laterally with sparser small ones, posteriorly with a few short, transverse rugae in middle.

Abdomen: Tergites with very scattered minute punctures except for an arcuate row near apex of each segment; pygidium covered with dense, short bristles.

Legs: Longer spur of hind tibia two-thirds the length of hind basitarsus, the latter with a comb of fine short setae beneath; fore tibial calcarium with a small tooth along inner edge two-thirds the distance from base; claws cleft.

Wings: Forewing with marginal cell acute at apex, third submarginal cell broader below than above, basal vein proximad of transverse median.

Anthobosca madecassa, new species

The present species is quite different from *insularis* (Smith), the only other *Anthobosca* known from Madagascar. The female of *madecassa* differs from that of *insularis* in being much smaller (mean length 6 mm.), the ferruginous head and thorax, and castaneous abdomen with large oval, anterolateral, creamy spots on tergites two and three. Its closest relative appears to be the equally small *minima* Turner, known only from the female, from Mombasa, Kenya. The latter species has a black head and thorax, marginal cell narrowly truncate at apex, narrow, transverse creamy bands laterally on tergites two to four, and the pygidium coarsely punctured.

Males of only a few of the Ethiopian species are known and it is not possible to offer any comparative notes. The male of *madecassa* is distinctly different from what Turner identifies as *erythronota* (Cameron), the only other African male before me.

The species apparently has a very limited distribution in southern Madagascar, the type series coming from Ihosy (March), Bekily (March), and Betroka (January).

Type: ♀; Bekily, Madagascar; March 1933; (A. Seyrig). [Cornell University, Type No. 2424].

Female. Length 6 mm. Shining; head and thorax except ventrally, scape and pedicel of antenna, and tegula, ferruginous; venter of head and thorax, black; flagellum of antenna, legs and abdomen except a large anterolateral, oval creamy spot on tergites two and three, dark castaneous. Vestiture moderately long, sparse and silvery except ferruginous on last abdominal tergite; mid and hind tibial spurs, whitish. Wings hyaline, stigma fuscous, veins testaceous.

Head: Anterior margin of clypeus medianly truncate; front with larger, scattered punctures on lower half and smaller, scattered ones on upper half; ocelli in a very low triangle, the ocellocular distance one and a half times the postocellar distance; vertex with scattered small punctures and a few minute ones.

Thorax: Pronotum dorsally with small, scattered punctures, laterally almost impunctate; mesoscutum with punctures denser medianly than laterally; scutellum with scattered, small punctures; postscutellum very narrow, impunctate on middle section; disk of mesopleuron with moderately close, small punctures; propodeum with dense, minute punctures except laterally where it is impunctate.

Abdomen: First tergite with sparse, small punctures on dorsal surface; second to fifth tergites with somewhat denser, small punctures and a few scattered larger ones except for arcuate, impunctate, depressed space at apices of segments; sternites two to five with punctures somewhat larger than on tergites; last tergite with basal fourth rather densely punctate, the remainder impunctate, moderately strongly shagreened.

Legs: Longer spur of hind tibia about two-thirds the length of hind basitarsus, the latter with a comb of fine, short setae beneath; claws cleft; calcarium of fore tibia deeply cleft at apex.

Wings: Forewing with marginal cell rounded at apex, third submarginal cell broader above than below.

Female paratypes are constant in sculptural characters, vary in length from 5.5 to 7 mm., and occasionally the abdomen is lighter castaneous.

Allotype: ♂; Bekily, Madagascar; March 1928; (A. Seyrig). [Cornell University].

Male. Length 6 mm. Black, shining; mandible at tip and fore tibia beneath, ferruginous; palpi, narrow line along inner margin of eye extending nearly to top, small spot behind eye above, narrow apical band on pronotum, tegula at base, axillary sclerite, fore femur at apex, fore tibia except beneath, fore tarsus, mid tibia at base, basal joints of mid tarsus, hind tibia at base, and outwardly except apex, hind basitarsus except apex, creamy; apex of tegula testaceous. Vestiture short, dense, silvery, erect on head and thorax, decumbent on abdomen; tibial spurs creamy. Wings hyaline, stigma fuscous, veins testaceous.

Head: Apical margin of clypeus medianly with two small, rounded teeth separated by a narrow shallow emargination; remainder of head finely punctate, the front densely so, elsewhere more sparsely; ocelli in a very low triangle, the ocellocular distance slightly greater than postocellar distance (5:4); linear tyloides present on flagellar segments eight to ten, that on tenth shorter than the others.

Thorax: Finely punctate, the punctures dense everywhere except on lateral surface of propodeum, middle of scutellum and postscutellum where they are sparser; propodeum with coarse shagreening.

Abdomen: Tergites with fine, dense punctures except apical one where they are larger; sternites with somewhat larger, more scattered punctures; hypopygium moderately broad, rounded at apex, densely punctate.

Wings: Forewing with marginal cell pointed at apex, third submarginal cell broader above than below.

Legs: Hind tibia with five or six short, blunt teeth above; longer spur of hind tibia half the length of hind basitarsus; calcarium of fore tibia shallowly cleft at apex.

Male paratypes are constant in sculptural characters, show very slight variation in extent of pale maculations, and vary in length from 5 to 6 mm.

Paratypes: 4 ♂♂, Bekily, Madagascar, March 1928, (A. Seyrig). 1 ♀, same data, but March 1930. 3 ♀♀, same data, but March 1932. 1 ♀, same data, but March 1933. 2 ♀♀, same data, but April 1932. 1 ♀, Ihosy March 1933, (A. Seyrig). 2 ♀♀, Betroka, Madagascar, January 1933, (A. Seyrig). [Cornell University]. Paratypes of both sexes have been deposited in the U. S. National Museum and the author's collection.

Tiphia saussurei,[5] new species

The present species may be distinguished from *bisinuata* Saussure, the only other Madagascan *Tiphia*, by the lack of a transverse carina anteriorly on the disk of the first abdominal tergite. While only the female of *bisinuata* is known, it seems reasonable to assume that the male will have this carina also, for experience with other species of *Tiphia* has demonstrated that when this carina is present in the female, it is also present in the male. The converse, however, is not true.

Type: ♂; Fianarantsoa, Madagascar; Sept.-Oct. 1938; (Ch. Lamberton; in gardens and fields). [K. V. Krombein Collection]. Placed on loan deposit in U. S. National Museum.

Male. Length 7 mm. Black, shining; palpi, mandible except tip, scape and pedicel of antenna apically, first flagellar segment entirely, apices narrowly of all femora and tibiae, fore tibia beneath, apices of fore and mid basitarsi and all hind tarsal segments, apical four seg-

[5]For Henri de Saussure, pioneer monographer of the Madagascan Hymenoptera.

ments of fore and mid tarsi entirely, and apex of last abdominal segment, ferruginous; flagellum of antenna except basal segment, castaneous. Vestiture sparse, silvery, moderately long; tibial spurs ferruginous. Wings subhyaline, stigma and veins fuscous.

Head: Clypeus with median apical margin narrowly produced, impunctate, slightly emarginate apically, the lateral teeth slightly upturned; front densely punctate below middle and along inner eye margin, the space before fore ocellus very sparsely punctured; vertex and head beneath sparsely punctured except near occipital carina; antenna short and stout, median flagellar segments not much longer than broad, tyloides absent.

Thorax: Pronotum margined anteriorly by a strong, complete carina, dorsal surface very sparsely punctate and without minute punctures, lateral surface strongly shagreened, without a median, oblique groove; mesoscutum with a few scattered punctures discally, closely punctate along parapsidal furrow and posteriorly; tegula without marginal grooves; scutellum with large punctures along margins; postscutellum with minute, moderately close punctures; disk of mesopleuron with moderately large punctures of second-degree density, minute punctures lacking; metapleuron impunctate, finely shagreened; areola of propodeum narrowed toward apex, slightly longer than breadth at base, median carina present on basal two-thirds, surface adjacent to areola shagreened, posterior declivous surface irregularly and finely rugulose, lateral surface with about a dozen slightly oblique rugae.

Abdomen: First tergite with scattered punctures except apical band where there are about two rows of contiguous punctures not set in a groove; punctation of second tergite mostly of third-degree density; punctation of third to sixth tergites varying from second- to third-degree density, somewhat denser on sixth, apical incised lines lacking; apical third of first sternite practically impunctate; second sternite with punctation denser than on corresponding tergite; third to sixth sternites with scattered, small punctures except for narrow apical concentration of contiguous ones; third and fourth sternites with posterolateral tooth, that of third the smaller; fifth sternite with a posterolateral crescentic carina, adjacent to which there is no orifice; seventh sternite with a very narrow median strip impunctate.

Legs: Sensorium near apex of hind tibia, narrow, elongate, not impressed.

The paratype varies from the above description in being 8 mm. long, in being relatively more closely punctate, and in lacking a posterolateral denticle on the third sternite.

Allotype: ♀; Tananarive, Madagascar. [Cornell University].

Female. Length 11.0 mm. Black, shining; mandible except tip, apex of scape, apex of pygidium, and tibial spurs, castaneous. Vestiture sparse, silvery, moderately long on mesopleuron and abdominal sternites. Wings infumated, nervures fuscous.

Head: Clypeus with median produced portion impunctate, narrow, rounded on apical margin; front with moderately large punctures, subcontiguous on a narrow strip above antennae, more scattered on the upper three-fourths where they vary from second to third-degree density; ocelli in a low triangle, the postocellar distance three-fifths the ocelloocular distance; vertex with punctures of third-degree density, those on temple mostly of second-degree.

Thorax: Pronotum with anterior carina present only on lateral declivous surface, the dorsum with third-degree punctures except for posterior arcuate row of second-degree, lateral declivous surface with numerous fine, oblique wrinkles on lower two-thirds, no impressed groove in middle; mesopleuron with anterior carina present, the discal punctures mainly of first-degree density and varying sizes, but without numerous minute, interspersed punctures; tegula about as long as broad, glabrous, lacking marginal grooves, a few punctures at inner posterolateral corner, the posterior margin not thickened; metapleuron with carinae numerous, fine and almost longitudinal in direction; lateral surface of propodeum with the carinae coarser than on metapleuron and oblique; areola of propodeum slightly over twice as long as basal width, median carina well-developed, lateral carinae curving inwards toward apex which is about two-thirds the basal width; area laterad of areola minutely shagreened anteriorly and with a few scattered, small punctures; lateral and posterior carinae of dorsum well-developed; posterior surface above with moderately large punctures of first-degree density.

Abdomen: Dorsum of first tergite without anterior transverse carina, posteriorly with several transverse rows of contiguous punctures not set in a groove; tergites two to five without incised apical lines, but with narrow testaceous margins, the punctures on second of third-degree density, of third to fifth rather closer, usually of first degree density; pygidium punctate on basal half, the posterior margin of punctate part transverse, the apical half smooth, not wrinkled or shagreened, the apical margin narrowly rounded; disk of first sternite with posterior groove only, the surface with moderately dense minute punctures.

Legs: Hind basitarsus with a longtiudinal groove on inner surface, the outer surface with a row of three short, flattened, lanceolate spines, one apical, the other two at one-third and two-thirds the distance from base of segment.

Paratype: ♂; Bekily, Madagascar; March 1933; (A. Seyrig). [Cornell University].

Tiphia bisinuata Saussure

Tiphia bisinuata Saussure, 1891. Mitt. Schweiz. Ent. Ges. 8:253. [♀; Madagascar; type in Geneva Museum (?)].—Saussure, 1892. *In* Grandidier, Hist. Madag. 20:236, pl. 18, figs. 27, 27a. [♀; Madagascar].—Dalla Torre, 1897. Cat. Hym. 8:134.—Hedicke, 1936. Hym. Cat. 1:6.

The presence of a transverse carina anteriorly on the horizontal surface of the first tergite of the female distinguishes *bisinuata* from *saussurei*. The following description is condensed from Saussure (1892).

Female. Length 16.5 mm. Black, shining; flagellum beneath ferruginous. Vestiture silvery or grey, except ferruginous on legs. Wings dark brown with violaceous reflections.

Head: Punctures of lower part of front strong, rugose and dense, becoming finer and almost reticulate above; ocelli on perpendicular plane of head.

Thorax: Pronotum truncate in front, but without a sharp carina, the dorsal surface anteriorly with strong oblique punctures, the posterior part broadly impunctate; mesoscutum with very deep, large punctures; tegula large, rounded; scutellum and postscutellum more finely punctate; areola of propodeum very finely rugulosopunctate, bisected by a fine groove or obsolete carina, bordered by strong carinae, the posterior surface shining, bordered by strong carinae.

Abdomen: First two tergites with sparse punctures, the first with a sharp, transverse carina at base of dorsal surface, the second with apical margin more densely punctate, the following tergites successively more and more densely punctate except at base, the punctures elongate; hypopygium rugose; second sternite with rather large punctures; third to fifth sternites with fine punctures except the posterior margins more coarsely and densely punctate.

Meria vonizongo,[6] new species
(Text Fig. 1)

The maculated thorax, differently shaped first abdominal segment which is sessile at apex, not nodose, and relatively shorter hind basitarsus readily separate the male of *vonizongo* from other Madagascan myzinine males. This species runs to couplet 13 in Turner's key to the males of Ethiopian *Myzine* (1912. Trans. Ent. Soc. London 724-6.), but lacks a tubercle on first abdominal sternite and the last abdominal segment is red, not black with yellow maculations.

The female is unknown, but should be readily distinguishable from other Madagascan myzinine females by the following characters: Hind basitarsus without a comb beneath; second submarginal cell of forewing either petiolate or altogether lacking, the third submarginal cell extremely large; pygidial area not delimited nor with special sculpture.

Type: ♂; Tananarive, Madagascar. [Cornell University, Type No. 2425].

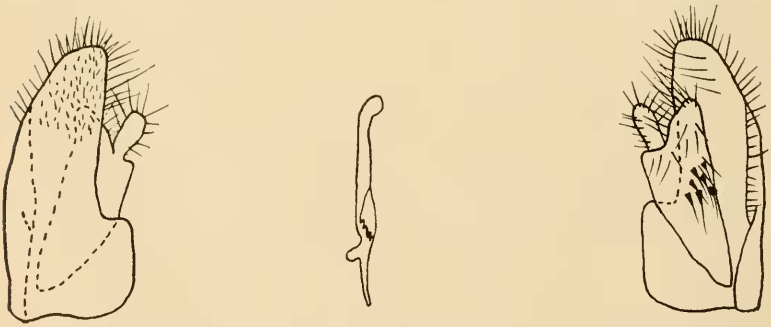
Male. Length 10 mm. Black, shining; mandible at tip, apex of clypeus medianly, all femora and tibiae except for creamy maculations noted elsewhere, last segment of hind tarsus, first two tergites laterally,

[6]Vonizongo—a subtribe of the Hova.

both tergites and sternites three to six laterally, last segment and hypopygium, ferruginous; the following creamy, palpi, mandible except tip, clypeus except apex medianly, narrow apical rim of frontal prominence, band on pronotum anteriorly interrupted medianly, band on posterior margin of pronotum, tegula at base, axillary sclerite, small median spot on scutellum, triangular spot on mesopleuron below forewing, margins of mesosternum medianly, small spot on all coxae, fore femur beneath, fore tibia above, mid femur on apical half beneath, mid tibia with spots above at base and apex, small spot on hind femur at apex above, small spots on hind tibia above at base and apex, tibial spurs, all tarsal segments except last segment of hind tarsus, first tergite with apical band emarginate anteriorly on each side of midline, segments two to six with apical bands broadly interrupted on each side of midline, the spots on sternites smaller than on tergites. Clothed with mod erately dense, appressed silvery pubescence which is noticeably longer on mesopleuron and sides of propodeum than elsewhere. Wings hyaline, veins fuscous except extreme base of costal margin creamy.

Head: Clypeus with punctures separated by less than the width of a puncture, the apical margin with a small, shallow median emargination; punctures of front contiguous along inner eye margin and on frontal prominence, sparser elsewhere; ocelli in a low triangle, the postocellar distance slightly less than ocellocular distance; vertex almost impunctate except for close punctures near occipital carina; head beneath with somewhat finer punctures than on front, these separated by less than the width of a puncture; flagellum filiform, longer than head and thorax, first segment slightly less than half the length of the second.

Thorax: Pronotum not carinate anteriorly, medianly with a very low impunctate ridge, laterad of this contiguously punctate, humeri bluntly protuberant; mesoscutum medianly with punctures as large as on prono tum, laterally the punctures finer and sparser except between parapsidal



TEXT FIGURE 1

Male genitalia of *Meria vonizongo*, new species. External lateral aspect at left (cardo and aedeagus omitted), ventral view of aedeagus in center, and internal aspect at right. (47X).

furrow and wings; scutellum punctured like middle of mesoscutum; postscutellum with fine, dense punctures; mesopleuron with large, subcontiguous punctures; metapleuron smooth, impunctate; propodeum with moderately large, contiguous punctures.

Abdomen: Anterior declivous surface of first tergite impunctate, the posterior horizontal surface with scattered, moderately fine punctures which are denser laterally, slightly constricted at apical margin; second to sixth segments slightly constricted at posterior margin and with an inconspicuous fringe of short, fine setae; seventh tergite with a few scattered, larger punctures, the apical emargination narrow, slightly longer than wide, lateral carinae poorly developed, not sharp, about one-third the length of exposed part of segment, margined inwardly by a few deep punctures; first sternite with dense, coarse punctures, not tuberculate; second sternite with scattered large punctures; third to sixth sternites more densely punctate than second, anteriorly the punctures very fine, laterally and posteriorly much coarser; seventh sternite rounded, not carinate anywhere, with fine, moderately close punctures. Genitalia as figured (Text Fig. 1), the cuspis on inner surface medianly with some stout teeth covering the bases of the setae in that region.

Wings: Forewing with second submarginal cell wider above than third (5:3), the relative lengths of first, second, and third submarginals below, 7:8:9, first recurrent nervure received by second submarginal cell two-thirds the distance from base, second recurrent received by third submarginal one-third the distance from base.

Mesa saussurei[7] (Turner), new combination
(Plate 6, Fig. 1)

Plesia (*Mesa*) *saussurei* Turner, 1910. Trans. Ent. Soc. London, p. 394. [♀; Tananarive; type in Berlin Museum.].

Elis (*Mesa*) *saussurei* Turner, 1912. Proc. Zool. Soc. London, p. 703 (in key), p. 709. [♀].

This and the following two species, *nodosa* and *seyrigi*, form a fairly well-defined series separable from *tandrona*, *madecassa* and *marovatana* by the relatively smaller size of both sexes, presence of scales on inner surface of cuspis of male genitalia and the comparatively weak bristles on front, pronotum and pygidium of females.

[7] *Mesa* Saussure, 1892 is not preoccupied by *Messa* Leach, 1817 for the two names do not have a common origin and meaning (Opinion 147, Int. Comm. Zool. Nomencl., 1943). Saussure's name is stated by Dalla Torre to be derived from μεσος, middle. Leach gives no origin for *Messa*, but since he was prone to use proper names for his new genera, it is reasonable to assume that *Messa* is of such a derivation. Agassiz in his Nomenclator Zoologicus says that *Messa* is a proper name, and Berry in the Appendix of Proper Names in the Classic Greek-English and English-Greek Dictionary, 1930 (Follett Publ. Co.) states "Messa, city and harbor in Laconia, near the promontory of Taenarum."

The male described below has been unknown previously or, at least, not separated from that of *nodosa*. Guérin's brief description of *nodosa* and Saussure's description and figure agree with the male I place under *nodosa* better than with the male I associate with *saussurei*. Turner (1912, p. 713) either relied on Saussure's description of *nodosa* or any males he had agreed with that description. It is not clear from his paper whether he actually had any males at all.

Superficially the male resembles that of *nodosa* very much, being of an equally small size (ave. 11 mm. long), but is readily distinguished from *nodosa* by the sparser pubescence, relatively denser punctation of upper part of front and head beneath, the proportionately longer petiole, the rugosopunctate posterior slope of propodeum and usually the presence of small pale maculations posterolaterally on tergites two to four or five (occasionally banded or entirely black).

The female is separable at once from all but *scyrigi* by the reduced ferruginous areas. The strongly infumated wings separate it superficially from the latter species. The other differentiating characters are the comparatively more coarsely punctured integument, obliquely striate posterior part of lateral surface of pronotum, and coarsely shagreened apical rim of pygidium. The female is remarkably constant in coloration as compared to the male which is quite variable in the extent of ferruginous and creamy maculations.

I have not examined Turner's type, but his description can apply to no other female known to me and agrees very well with the series before me.

Male. Length 9-15 mm. (mean 11 mm.). Black, shining; palpi, mandible at tip, tibiae and tarsi usually except fore tibia externally, all tibial spurs and apex of tegula, ferruginous; mandible except tip, usually small median spot on apical margin of clypeus, narrow rim of frontal prominence, fore and usually mid tibiae externally, occasionally spot at base of hind tibia externally, tegula at base and axillary sclerite, margins of mesosternum medianly, and small spot at posterolateral corner of tergites two to four or five (three to five with spots often united by narrow apical bands, more rarely abdomen entirely black), creamy. Clothed with erect, silvery hairs which are not so dense as in *nodosa;* last tergite with hair dark and sparse. Wings hyaline, nervures fuscous.

Head: Median emargination of clypeus somewhat narrower than in *nodosa*; frontal prominence shallowly concave, densely punctate; rugose punctation of front extending almost to anterior ocellus; beneath with punctures rather close, mostly not separated by more than the width of a puncture.

Thorax: Punctured much like *nodosa* except posterior slope of propodeum rather coarsely rugosopunctate.

Abdomen: Petiole of first segment nearly one-half the total length; first sternite on basal half with two longitudinal carinae separated by a narrow punctate groove; last tergite with apical emargination shallow, pygidial area flat, the delimiting carinae sharp, about one-half the length of the exposed part of segment, margined inwardly by punctures; abdomen presenting a relatively thicker appearance apically than in other species when viewed from the side due to the proportionately larger genitalia; inner surface of cuspis with modified setae shorter and more broadened at tip than in *nodosa.*

Female. Length 8-12 mm. (mean 10 mm.). Black, shining; palpi, mandible except tip, clypeus, scape and first segment of antennal flagellum, rim of frontal prominence, fore tibia and all tarsi in varying degrees, ferruginous. Vestiture sparse, short, silvery, somewhat longer on abdomen, setae on front, pronotum and pygidium not thickened; mid and hind tibial spurs whitish. Wings strongly infumated, with violaceous reflections, marginal cell of forewing darker than rest of wing.

Head: Front and vertex with coarse, deep, subcontiguous punctures, sparser immediately around ocellar area; ocelli in a low triangle, the ocellocular distance slightly greater than the postocellar distance (9:7); beneath with most punctures separated by the width of a puncture or less.

Thorax: Dorsum of pronotum coarsely and deeply rugosopunctate, the lateral vertical surface punctate anteriorly, obliquely striate posteriorly; mesoscutum and scutellum coarsely punctate, the mesoscutum more sparsely so; postscutellum with dense, minute punctures; mesopleuron with coarse, subcontiguous punctures on disk; metapleuron with dense, minute punctures; propodeum dorsally with the median groove bisected by a central carina, and with a row of punctures adjacent laterally, laterad of this with some punctures increasing in density laterally and posteriorly, posterior surface with subcontiguous punctures on upper half and more scattered ones on lower half, lateral surface with numerous, slightly oblique rugulae.

Abdomen: Anterior declivous surface of first tergite with scattered small punctures; horizontal posterior surface of first tergite, and second to fifth tergites with rather close, moderate size punctures, becoming denser towards apices; first sternite on posterior expanded part with dense, very fine punctures; second to fifth sternites with small, subcontiguous punctures at base, larger, scattered ones medianly and a narrow concentration of contiguous, small punctures at apex; pygidium finely rugulosopunctate and with a narrow, strongly shagreened, impunctate rim.

Legs: Longer spur of hind tibia about three-fourth as long as hind basitarsus, broadly rounded on outer margin just beyond basal emargination; comb of hairs on hind basitarsus beneath margined outwardly by only two long bristles respectively about one-half and three-quarters the distance from base.

Distribution. Intensive collecting will probably show that this species is present in most of Madagascar with the possible exception of the xeric southwest coast. I have examined a total of 85 specimens (39 females and 46 males) from the following localities (reading from north to south) during the months of October through April, and July: Nossi-Bé, V [allée] de Sambirano [Rivière], Maroantsetra, Majunga, Morafenobe, Maevatanana, Tananarive, Vatomandry, Betroka, [Mt.] Kalambatitra, Bekily and Antanimora. I have seen a male from Fitanpito (?), a locality which I am unable to find on any map.

Mesa nodosa (Guérin), new combination
(Plate 6, Fig. 2)

Myzine nodosa Guérin, 1837. Dict. pitt. hist. nat. 5:577. [♂; Madagascar; type in Paris Museum (?)].—Saussure, 1892. *In* Grandidier, Hist. Madag. 20:240, pl. 22, fig. 6. [♂; Tananarive].—Dalla Torre, 1897. Cat. Hym. 8:125.

Plesia (*Mesa*) *hova* Turner, 1908. Ann. Mag. Nat. Hist. (8) 1:504. [♀; Tamatave; variety (!) from Betsileo; type in British Museum]. NEW SYNONYMY.

Elis (*Mesa*) *hova* Turner, 1912. Proc. Zool. Soc. London, p. 704 (in key), p. 707. [♀].

Elis (*Mesa*) *nodosa* (Guérin) Turner, 1912. Proc. Zool. Soc. London, p. 704 (in key), p. 713. [♂].

This is the most common of the Madagascan *Mesa* and apparently is distributed over most of the island with the possible exception of the xeric southwest coast.

The generally smaller size (11 mm. ave. length) distinguishes the male from the other Madagascan *Mesa* except *saussurei*. It is easily separated from the latter species by the denser silvery pubescence (the "duvet blanc" of Guérin), the relatively sparser punctation of upper part of front and head beneath, the somewhat shorter petiole of the first abdominal segment, the entire lack of pale maculations on abdomen, and the punctate, non-rugose posterior slope of propodeum. The genitalia are quite distinct as may be seen by reference to the figures.

The female is readily separated from all other species by the shape of the longer hind tibial spur which is right-angled on outer margin just beyond the basal emargination. The female is quite variable in the extent of ferruginous maculations, but there is no apparent geographical correlation and, therefore, no basis for using this character for subspecific differentiation.

Turner (1908) states that the female is allied to *atopogamia* (Saussure) from Africa. However, this is only a superficial

color resemblance as the latter species has, among other characters, a differently shaped hind tibial spur.

Turner, in describing *hova*, notes that it is almost certain to be the female of *nodosa*. I do not know on what grounds Turner based this statement, but I am basing the synonymy given above on the fact that *nodosa* males and *hova* females are relatively less strongly sculptured than the males and females I have associated under *saussurei*. In addition, *nodosa* males and *hova* females are more common than the two sexes of any other species considered here.

I have not seen any of the types, but the size, lack of abdominal maculations and dense silvery pubescence of the males agree better with Guérin's description than any other males. Saussure's identification of the male of *nodosa* agrees with mine for he mentions the abdomen as being entirely black and the dense silvery pubescence and gives a figure of the first abdominal segment which agrees better with this male than with that of *saussurei*. Turner's original description of *hova* is adequate for the definite determination of the female.

Male. Length 8-13 mm. (mean 11 mm.). Black, shining; palpi, mandible at tip, fore and mid trochanters and femora usually, fore tibia except externally, mid and hind tibiae usually except spot at base externally, all tarsi, all tibial spurs, and apex of tegula, ferruginous; mandible except tip, narrow rim of frontal prominence, fore tibia externally, mid and hind tibiae at base externally, tegula at base, axillary sclerite, and margins of mesosternum medianly, creamy. Densely clothed with short, erect silvery hairs which are especially conspicuous on abdomen; last tergite with hairs dark and sparse. Wings hyaline, nervures fuscous.

Head: Median emargination of apical margin of clypeus broader than in other species; frontal prominence shallowly concave, densely punctate; rugose punctation of front usually extending only half the distance to lower ocellus, the remaining area and vertex rather sparsely punctured; punctation beneath sparser than in other species, the individual punctures separated by several times the width of a puncture.

Thorax: Upper triangular area of metapleuron smooth and shining; posterior slope of propodeum closely punctate, but not rugose.

Abdomen: Petiole of first segment about one-third the total length; first sternite rounded basally, without longitudinal carinae; last tergite with apical emargination shallow, pygidial area flat, the delimiting carinae short, about one-third the length of the exposed part of segment, the carinae margined inwardly by deep, contiguous punctures; inner surface of cuspis with modified setae longer and more slender at tip than in *saussurei*.

Female. Length 9-13 mm. (mean 10 mm.). Black, shining; color varying from those having only palpi, mandible except tip, and tegula, ferruginous, to those having palpi, mandible except tip, scape and basal

segment of antennal flagellum, head except beneath, pronotum, mesoscutum, scutellum, tegula, anterior tibia and tarsus, ferruginous. Wings infumated, not so strongly as in *saussurei*, paler at base, marginal cell of forewing darker. Vestiture as in *saussurei*.

Head: Front with coarse, contiguous punctures on lower half or two-thirds and along inner eye margin narrowly, the upper half or third broadly impunctate; vertex with scattered punctures, denser behind and between eye and lateral ocellus; beneath with scattered punctures most of which are separated by more than the width of a puncture; ocelli in a low triangle, ocellocular distance twice the postocellar distance.

Thorax: Everywhere comparatively more sparsely punctate than *saussurei*, and with the following differences; lateral surface of pronotum posteriorly with only a few short, finer striae; dorsal surface of propodeum with median groove narrower, central carina and adjacent row of contiguous punctures lacking, anteriorly in middle with fine, dense punctures, posteriorly with coarse, contiguous ones, posterior surface with dense, fine punctures except above and laterally where there are a few larger ones.

Abdomen: Anterior declivous surface of first tergite with numerous fine punctures and a few larger ones laterally; elsewhere punctured much as in *saussurei*, but comparatively more sparsely; pygidium like *saussurei*, but narrow rim shining and impunctate, not coarsely shagreened.

Legs: Longer spur of hind tibia about three-fourths as long as hind basitarsus, the outer margin right-angled just beyond basal emargination; comb of hairs on hind basitarsus beneath margined outwardly only by two long bristles respectively about one-third and two-thirds their distance from base.

Distribution. Like *saussurei*, this species will probably prove to be distributed over most of Madagascar with the possible exception of the xeric southwest coast. I have examined a total of 123 specimens (49 females and 74 males) from the following localities (reading from north to south) during the months of December through March: Maroantsetra, Morafenobe, Mahabo, Antanambe, Maintirano, Tamatave, Tananarive, Ihosy, Betroka, Bekily and Antanimora.

Mesa seyrigi,[8] new species
(Plate 6, Fig. 6)

In size and coloration the female of the present species resembles *saussurei*, but has hyaline wings and less coarse punctation. It is distinguished from that species, in addition to the characters noted above, by the arrangement of ocelli in an equilateral triangle, lack of numerous fine striae posteriorly

[8]For the late André Seyrig whose intensive collecting of Madagascan Hymenoptera has formed the basis for his studies on the Ichneumonidae, Arnold's work on the Sphecidae and the present paper on the Tiphiidae.

on the lateral vertical surface of pronotum, the presence of a row of about six flat, short spines on basal two-thirds of hind basitarsus adjacent to the comb beneath, and the lack of a narrow shagreened apical rim on pygidium.

The male I assign below as the allotype may be incorrectly associated since it is from Tananarive and the females from Bekily and Antanambe. However, it belong to the same species group as *nodosa* and *saussurei* as evidenced by the modified scale-like setae on the inner surface of the cuspis. Externally it is very close to *marovatana* and I had assigned it there originally, but the very distinctive genitalia separate it at once from all species. The paramere is broadened toward the apex, subtruncate at apex and surmounted by a stout thorn. In all other species the paramere is narrowed toward the apex.

Type: ♀; Bekily, Madagascar; March 1930; (A. Seyrig). [Cornell University, Type No. 2429].

Female. Length 10 mm. Black, shining; palpi, mandible except tip, apical half of clypeus, tegula, axillary sclerite, legs except coxae and tibial spurs, ferruginous; antenna, coxae and abdomen, dark castaneous. Vestiture sparse, short, silvery, somewhat longer on abdomen; hairs of front, pronotum and pygidium not thickened. Wings hyaline except marginal cell of forewing deeply infuscated.

Punctation much as in *saussurei*, but sparser and not so coarse, the main differences as follows: Ocelli arranged in an equilateral triangle, the ocellocular distance twice the postocellar distance; scutellum with comparatively smaller punctures which are very sparse; dorsal surface of propodeum with median groove narrower and not carinate down the middle, lacking a row of contiguous punctures adjacent to groove and rather densely and minutely punctate elsewhere, some larger, contiguous punctures at apex, posterior surface with scattered large punctures which are somewhat denser above and laterally; narrow apical rim of pygidium impunctate, smooth, not coarsely shagreened; hind basitarsus with comb of hairs beneath margined outwardly by a row of about six flattened, short bristles on basal two-thirds and a long slender bristle about three-quarters of distance from base.

The topotypic female paratype is 9.5 mm. long and the female paratype from Antanambe is 15.0 mm. long. Both agree with the type in all essential details of coloration and sculpture.

Allotype: ♂; Tananarive, Madagascar. [Cornell University].

Male. **Length 15 mm. Black,** shining; fore and mid legs except coxae, hind tarsal segments with narrow apical annulations, tibial spurs, narrow anterior margin of frontal prominence, tegula and axillary sclerite, ferruginous; mandible at tip and hind leg except coxa and annulations on tarsal segments, castaneous; palpi, mandible except tip,

small spots externally at base of fore tibia, apices of fore and mid tibiae, and margins of mesosternum medianly, creamy; Vestiture moderately dense, silvery except on last tergite where it is sparser and dark. Wings hyaline, nervures fuscous.

Sculpture very similar to *marovatana* with the following exceptions: Frontal prominence more sparsely punctate along margins, lateral surface of pronotum more sparsely punctate along lower margin, lateral carinae of pygidium longer, about one-half the length of exposed part of segment.

Paratypes: ♀ ; same data as type; [K. V. Krombein Collection]. ♀ ; Antanambe, Madagascar; [U. S. National Museum].

Mesa madecassa, new species
(Plate 6, Fig. 3)

This and the following two species, *tandrona* and *marovatana*, are very closely related and form a fairly well-defined series separable from *nodosa*, *seyrigi* and *saussurei* by the larger size of both sexes, lack of scales on inner surface of cuspis of male genitalia, and presence of stouter bristles on front, pronotum and pygidium of females. It is probable that further collecting may establish the existence of additional species in this series, since the three discussed here apparently are very circumscribed in distribution.

The male is very close to *tandrona* and *marovatana*, but may be readily distinguished from the former by the smooth upper triangular area of the metapleuron and in being comparatively more slender. It is separated from *marovatana* by the narrower, deeper apical emargination of pygidium, lack of creamy spots on anterior tibia, and the longer, stronger lateral carinae of pygidium. Minute genitalic differences also exist.

The female is readily distinguished by being almost totally ferruginous, rather than black with ferruginous markings as in the other species. From *tandrona* and *marovatana* it is also distinguished by the relatively greater postocellar distance, broadly impunctate upper half of front, and relatively sparser and smaller punctures on dorsum of pronotum.

The association of sexes is based on the relatively large size and from both having been collected at Bekily in southern Madagascar.

Type: ♂ ; Bekily, Madagascar; December 1932; (A. Seyrig). [Cornell University, Type No. 2427].

Male. Length 15 mm. Black, shining; palpi, tegula and axillary sclerite, fore leg except coxa, mid leg except coxa and tarsus, hind tibia beneath, and all tibial spurs, ferruginous; mandible at tip, mid tarsus, hind femur, tibia except beneath and tarsus, castaneous; mandible except tip and margins of mesosternum medianly, creamy. Clothed with moderately dense, silvery pubescence except last tergite where it is dark

and sparse. Wings hyaline, nervures fuscous.

Head: Median emargination of apical margin of clypeus narrow and shallow; frontal prominence with a deep median groove and more sparsely punctate along lateral margins than elsewhere; front with punctures large, shallow and contiguous, extending to fore ocellus; vertex with punctures smaller and sparser than beneath; beneath with punctures of an intermediate size as compared with those of front and vertex, not contiguous, separated from each other by less than the width of a puncture.

Thorax: Punctured much like *saussurei* except that posterior slope of propodeum is not so coarsely rugosopunctate.

Abdomen: Petiole of first segment short as in *nodosa*, about one-third the total length; first sternite at base evenly rounded, without carinae; apical emargination of the last tergite narrower than in *marovatana*, almost as deep as wide, pygidial area flat, the delimiting carinae short, about one-third the length of exposed part of segment, with a few punctures along inner margins.

Allotype: ♀; Bekily, Madagascar; March 1930; (A. Seyrig). [Cornell University].

Female. Length 14 mm. Ferruginous, shining; middle of mesosternum, first tergite narrowly at apex, second tergite except for a large anterolateral spot, and third and fourth tergites except for small lateral spots, black; metasternum, middle of dorsal and posterior surfaces of propodeum, and basal half of third and fourth sternites, castaneous. Vestiture sparse, similar to *nodosa* except that bristles of front, dorsum of pronotum, and pygidium, stouter and ferruginous. Wings moderately infumated and with violaceous reflections, marginal cell of forewing not darker than rest of wing.

Head: Front with coarse, contiguous punctures on lower half, the upper half impunctate except for a few scattered smaller ones along inner eye margin; vertex with a few scattered smaller punctures; beneath with scattered, smaller punctures; groove adjacent to occipital carina beneath not deep, not crenulate; ocelli in a low triangle, the ocellocular distance slightly over twice the postocellar distance (11:5).

Thorax: Dorsal surface of pronotum with relatively small, subcontiguous punctures, a narrow median strip impunctate, lateral surface with some scattered punctures anteriorly and above, posteriorly with only a faint indication of a few short, fine striae; mesoscutum and scutellum with relatively small, scattered punctures; postscutellum with dense, minute punctures; mesopleuron on disk with large, subcontiguous punctures; metapleuron with dense, minute punctures; dorsal surface of propodeum with median groove moderately broad, bisected by a carina on basal half, but no impressed, adjacent row of large punctures, the remainder of dorsal surface with small, dense punctures except for large, contiguous ones posteriorly, lateral surface with close, oblique rugulae, posterior surface with dense, small punctures and a few scattered large ones.

Abdomen: Punctation of first five segments as in *nodosa;* pygidium similar to *nodosa,* but with stouter bristles.

Legs: Longer spur of hind tibia about three-fourth as long as hind basitarsus, the outer margin broadly rounded just beyond the basal emargination; comb of hairs on hind basitarsus beneath margined only by two long bristles respectively about one-third and two-thirds their distance from base.

The paratype female differs in no essential respect.

Paratype: ♀; Bekily, Madagascar; January 1933; (A. Seyrig). Deposited in U. S. National Museum.

Mesa marovatana,[9] new species
(Plate 6, Fig. 4)

This species is closely related to *madecassa* and *tandrona.* The female may be separated from those species by the larger size (possibly a series of each species involved would show overlapping size ranges), entirely dark vestiture, and the deep, non-crenulate groove adjacent to occipital carina on under side of head. The male agrees very closely with that of *madecassa* in having the upper triangular area of the metapleuron smooth and in the slender form. There are minute genitalic differences between the two, the apical emargination of the pygidium is broader and shallower in *marovatana,* the delimiting carinae of the pygidium shorter and weaker, and the anterior tibia is ferruginous with creamy spots externally at base and apex, instead of entirely ferruginous as in *madecassa.*

The association of sexes is based on the relatively large size and from both having been collected at Tananarive in central Madagascar.

Type: ♂; Tananarive, Madagascar. [Cornell University, Type No. 2426].

Male. Length 16 mm. Black, shining; fore and mid legs except coxae and mid tarsus, hind tibia beneath, mid and hind tarsal segments with narrow apical annulations, and tibial spurs, ferruginous; mandible at tip, narrow anterior margin of frontal prominence, tegula, axillary sclerite, mid and hind tarsal segments except apical annulations, and hind leg except tibia beneath, castaneous; palpi, mandible except tip, small spots externally at base and apex of fore tibia, and margins of mesosternum medianly, creamy. Vestiture moderately dense, silvery except on last tergite where it is sparser and dark. Wings hyaline, nervures fuscous.

Sculpture very similar to *madecassa* with the following exceptions: Head beneath slightly less closely punctate; delimiting carinae of pygidial area shorter (about one-fourth the length of exposed part of segment), weaker, the apical emargination broader, about twice as wide as deep; paramere narrower, gradually narrowed toward tip.

Allotype: ♀; Tananarive, Madagascar. [Cornell University].

[9]Marovatana—a subtribe of the Hova.

Female. Length 18 mm. Black, shining; entire head except tip of mandible and head medianly beneath, dorsum of pronotum, mesoscutum, scutellum, middle of postscutellum, tegula, base of fourth and all of fifth and sixth abdominal segments, ferruginous; fore tibia, all tarsal segments narrowly at apices, apical half of second and third tergites, and apices of second and third sternites medianly, castaneous. Vestiture dark, the bristles on front, pronotum and pygidium stouter than in *nodosa;* all tibial spurs ferruginous. Wings strongly infumated and with violaceous reflections, the marginal cell of forewing darker than rest of wing.

Head: Front with coarse, contiguous punctures on lower half, becoming somewhat sparser laterally on upper half, only a narrow space before anterior ocellus impunctate; vertex with subcontiguous to scattered punctures of several sizes; ocelli in a low triangle, ocellocular distance slightly less than twice the postocellar distance (13:7); head beneath with very sparse, large punctures, the groove adjacent to occipital carina deep, but not crenulate.

Thorax: Dorsal surface of pronotum with coarse, contiguous punctures except a narrow, anterior, median impunctate spot and the apex narrowly, the lateral surface with some small punctures anteriorly and above, no trace of fine oblique carinae posteriorly; mesoscutum with coarse punctures concentrated posteriorly and along parapsidal furrow; scutellum with only a few coarse punctures toward side; postscutellum with dense, minute punctures; disk of mesopleuron with coarse, subcontiguous punctures; metapleuron with dense, minute punctures; dorsal surface of propodeum with median groove rather broad, bisected on basal half by a carina, adjacent lateral row of deep punctures lacking, the rest of surface with rather dense, minute punctures except for an apical concentration of large, contiguous ones, lateral surface with numerous oblique rugulae, posterior surface with dense, minute punctures except for a few larger ones above and laterally.

Abdomen: Punctured as in *tandrona,* but pygidium with more numerous bristles.

Legs: Longer spur of hind tibia as long as hind basitarsus, the outer margin broadly rounded just beyond basal emargination; comb of hairs beneath on hind basitarsus margined outwardly only by two long bristles respectively about one-half and three-quarters their distance from base.

Mesa tandrona,[10] new species

(Plate 6, Fig. 5)

The male of *tandrona* is very similar in appearance to those of *marovatana* and *madecassa,* but differs in the slightly stouter build, longitudinally rugulose upper triangular area of metapleuron, and the minute genitalic differences as figured.

The female, which resembles a large, fully maculated *nodosa* female, is distinguished from that species at once by the rela-

[10]Tandrona—a tribe of northwest Madagascar.

tively stouter bristles on front and pronotum and the differently shaped longer spur of hind tibia. From its closest relatives, *madecassa* and *maroratana*, it is separated by the deep crenulate groove adjacent to occipital carina on under side of head, the relatively denser punctation of scutellum arranged more or less in longitudinal rows, and the apex of pygidium reflexed upward.

The association of sexes is based on a single pair collected in the valley of the Sambriano River, in northwest Madagascar.

Type: ♂; V[allée] de Sambirano [Rivière], [northwest] Madagascar; (A. Seyrig). [Cornell University, Type No. 2428].

Male. Length 17 mm. Somewhat stouter than *madecassa*. Black, shining; palpi, mandible except tip, fore leg except coxa, and all tibial spurs, ferruginous; mandible at tip, mid and hind legs, tegula and axillary sclerite, dark castaneous; margins of mesosternum medianly, creamy. Clothed with moderately dense, silvery pubescence, except last two tergites where it is sparse and dark. Wings hyaline, nervures fuscous.

Head: Apical margin of clypeus evenly rounded, not emarginate; frontal prominence with median groove shallower and broader than in *madecassa*, and rather densely punctate everywhere; front with large, shallow, contiguous punctures extending to fore ocellus; vertex with scattered smaller punctures; punctures beneath head equal in size to those on vertex, but separated by less than the width of a puncture.

Thorax: Punctured much like *saussurei* except upper triangular area of metapleuron finely, longitudinally rugulose.

Abdomen: Petiole of first segment short, about two-fifths the total length of the segment; first sternite at base evenly rounded, without carinae; apical emargination of last tergite very shallow, about three times as wide as deep, pygidial area flat, the delimiting carinae long, about two-thirds the length of exposed part of segment, and with a few punctures along inner margins.

Allotype: ♀; V[allée] de Sambirano [Rivière], [northwest] Madagascar; (A. Seyrig). [Cornell University].

Female. Length 14.5 mm. Black, shining; palpi, mandible except tip, head except medianly beneath, scape entirely and flagellum beneath, pronotum, mesoscutum, scutellum, tegula, axillary sclerite, prosternum except medianly, and anterior femur and tibia, ferruginous; flagellum of antenna above, anterior tarsus, mid and hind femora and tibiae to some extent, and median spot on second sternite, castaneous. Vestiture sparse, similar to *nodosa* except that bristles of front, dorsum of pronotum and pygidium are stouter and ferruginous; mid and hind tibial spurs, white. Wings strongly infumated and with violaceous reflections, marginal cell of forewing darker than rest of wing.

Head: Front with coarse, confluent punctures except a narrow area impunctate before anterior ocellus; vertex with somewhat smaller, contiguous to subcontiguous punctures; ocelli in a low triangle, postocellar distance one and a half times the ocellocular distance; head beneath with scattered punctures, groove adjacent to occipital carina deep and crenulate.

Thorax: Dorsal surface of pronotum with coarse, contiguous punctures, the lateral surface with punctures more separated, but equally large; mesoscutum and scutellum as coarsely punctate as dorsal surface of pronotum, the mesoscutum sparsely punctate, the scutellum much more densely so, the punctures laterally arranged in longitudinal rows; postscutellum with dense, minute punctures; mesopleuron on disk with coarse, contiguous punctures; metapleuron with dense, minute punctures; dorsal surface of propodeum with median groove broad, bisected on basal half by a carina, adjacent row of large punctures lacking, laterad of groove with minute, rather dense punctures, at apex with large, contiguous pits, posterior surface with dense, minute punctures, some larger ones laterally and above, lateral surface with close, oblique rugulae.

Abdomen: Punctation similar to *nodosa* though somewhat sparser; pygidium with apex reflexed upward, the bristles very sparse, stout and short.

Legs: Longer spur of hind tibia about three-fourths as long as hind basitarsus, the outer margin broadly rounded just beyond basal emargination; comb of hairs on hind basitarsus beneath margined outwardly by only two long bristles respectively about one-half and three-quarters their distance from base.

Methocha cambonini Saussure

Methoca Cambonini Saussure, 1891. Mitt. Schweiz. Ent. Ges. 8:259. [♀; Madagascar; specific name probably a *lapsus* for *cambouei;* type in Geneva Museum (?)].

Methoca Cambouei (!) Saussure, 1892. *In* Grandidier, Hist. Madag. 20:299, pl. 22, fig. 8. [♀; Imerina Prov., Madagascar].

Methoca Cambouei (!) Saussure, 1892. *In* Grandidier, Hist. Madag. 20: expl. pl. 22, fig. 8.

Methoca cambouei (!) Dalla Torre, 1897. Cat. Hym. 8:1.

I know this species only from Saussure's description and figure. The male of one of the two new species described below may be the opposite sex of *cambonini*, but it is impossible to decide this from the limited material at hand. The following description is paraphrased from Saussure (1892).

Female. Length 8-11 mm. Black, shining; mandible, antenna on basal half, and legs except tarsi, obscurely ferruginous. Sparsely clothed with short, griseous hairs which are denser on the abdominal tergites. Wingless.

Head: Clypeus triangular, slightly convex, apical margin weakly rounded; face slightly convex, finely longitudinally striate, with a feeble,

median cariniform tubercle slightly above antennae; ocelli in an equilateral triangle; vertex punctate, more or less in transverse rows.

Thorax: Not compressed, with separated punctures which are denser anteriorly than posteriorly; pronotum globose, ovate; mesoscutum rather flat, densely shagreened, separated from mesopleuron by a groove; mesopleuron striate; scutellum ovoidal, convex, but scarcely elevated into a tubercle, with strong separated punctures; propodeum globose, punctured above, striate on sides.

Legs: Anterior femur sinuate above, middle femur only feebly so, and posterior femur only in middle.

Methocha arnoldi,[11] new species

Relatively few *Methocha* males are known from the Ethiopian region which suggests the possibility that the species are frequently parthenogenetic as in the Palaearctic *articulata* (Latreille) (=*ichneumonides* Latreille). The unique type of *plesioides* Turner from Spanish Guinea and the unique types of this and the following new species are the only male specimens recorded from the Ethiopian region. Turner's description of *plesioides* (1911. Mitt. Zool. Mus. Berlin 5: 389) is not as detailed as one could wish, but he mentions that the first abdominal segment is petiolate and three times as long as broad at apex, whereas in the males of the two species described here the first abdominal segment is not petiolate, and the apical width is three-fourths the length. In the relatively sparse punctation *plesioides* resembles *lambertoni* more than *arnoldi*.

Type: ♂; near Rogez, Madagascar; June 1946; 900 meters; (Ch. Lamberton). [K. V. Krombein Collection]. Placed on loan deposit in U. S. National Museum.

Male. Length 8 mm. Black, shining; mandible ferruginous; palpi, fore tarsus, and tibial spurs, castaneous. Vestiture short, erect except on mesopleuron and legs, silvery and moderately dense on head and thorax, sparse and dark on abdomen, that of antenna dense and black. Wings hyaline and iridescent, stigma and veins fuscous.

Head: Clypeus convex, sparsely punctate, not tuberculate at base, median apical margin shallowly emarginate; front with a blunt, median prominence, subcontiguously punctate; vertex and head beneath more sparsely punctate; lines tangential to outer edges of fore and lateral ocelli interseeting at a right angle, the postocellar distance slightly less than half the ocellocular distance (5:11).

Thorax: Pronotum densely punctate except the central posterior half of the dorsal surface; mesoscutum more densely punctate laterally than in middle; scutellum more densely punctate anteriorly and laterally

[11]For Dr. George Arnold, Director of the National Museum of Southern Rhodesia, in recognition of his painstaking series of papers on African wasps.

than posteriorly; mesopleuron convex, densely punctate, without grooves or a large, deep punctiform impression; upper area of metapleuron smooth, lower area with some oblique rugae; dorsal and posterior surfaces of propodeum deeply and very coarsely rugosoreticulate, lateral surface with large, contiguous punctures arranged in oblique rows.

Abdomen: Punctation of tergites and third to sixth sternites finer than on thorax, rather dense on first tergite and becoming progressively sparser to the sixth segment; first and second sternites with larger punctures, those of first slightly sparse; seventh tergite convex, with a few small, scattered punctures, slightly emarginate at apex; hypopygium moderately closely punctate at base.

Legs: Carina along inner margin of upper surface of hind coxa not expanded into a lamella in middle.

Methocha lambertoni,[12] new species

This species is easily distinguished from *arnoldi*, the only other male *Methocha* known from Madagascar, by the finer and sparser punctation, ratio of postocellar to ocellocular distance and the deep, broad punctiform impression anteriorly between mesopleuron and mesosternum.

Type: ♂; near Rogez, Madagascar; November 1946; 900 meters; (Ch. Lamberton). [K. V. Krombein Collection]. Placed on loan deposit in U. S. National Museum.

Male. Length 6.5 mm. Black, shining; palpi, mandible, apical half of clypeus, and tibial spurs, ferruginous; legs in varying degrees castaneous. Vestiture and wings as in *arnoldi*.

Head: Clypeus convex, sparsely punctate, not tuberculate at base, median apical margin shallowly emarginate; frontal protuberance slightly more prominent than in *arnoldi*, lower two-thirds of front with subcontiguous punctures somewhat smaller than in *arnoldi*, upper third of front, vertex and head beneath with sparser punctures; lines tangential to outer margins of fore and lateral ocelli intersecting at slightly less than a right angle, the postocellar distance less than ocellocular distance (2:3).

Thorax: Pronotum with fine, scattered punctures; mesoscutum with larger, closer punctures; scutellum and postscutellum with only a few fine punctures; mesopleuron convex, with fine punctures, somewhat closer anteriorly, without grooves, but with a deep, broad punctiform impression anteriorly between mesopleuron and mesosternum; upper area of metapleuron smooth, lower area with some oblique rugae; upper and posterior surfaces of propodeum more finely rugosoreticulate than *arnoldi*, lateral surface with oblique rugae.

Abdomen: Punctured as in *arnoldi*, but comparatively more finely and sparsely; hypopygium practically impunctate basally.

Legs: Carina along inner margin of upper surface of hind coxa not expanded into a lamella.

[12]For Prof. Ch. Lamberton, Secrétaire de l'Académie Malgache, who has furnished me with many interesting Madagascan wasps.